

United States Government

Winston

244.12.5
Department of Energy

memorandum

DATE: FEB 6 1991

REPLY TO: EM-421
ATTN OF:

SUBJECT: Authority Determination--Former Beryllium Production Facility in Luckey, Ohio

TO: The File

The attached review documents the basis for determining whether DOE has authority for taking remedial action at the former beryllium production facility in Luckey, Ohio, under the Formerly Utilized Sites Remedial Action Program (FUSRAP). The following factors are significant in reaching determination:

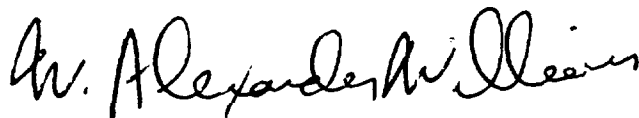
- o The land was owned by the government at the time that the facility produced beryllium.
- o The facility was controlled by the AEC both directly and indirectly.
- o The beryllium ore was owned by the government and ground at the AEC Middlesex facility before shipment to Luckey.
- o The site was inspected on many occasions by the AEC health and safety staff.

The sources of the observed contamination are important in determining DOE's authority for remedial action. The beryllium contamination at the site was clearly caused by the beryllium production operations. The radioactivity was probably caused by one or more of the following: (1) high natural radioactivity in the beryllium ore; (2) contamination of the ore when it was ground at Middlesex; or (3) a shipment of "slightly contaminated" scrap steel from the AEC New York Operations Office. The actual source of the radioactivity is not precisely known; however, DOE has authority to remedy contamination resulting from any or all of these sources.

A draft copy of the authority review was furnished to the Office of General Counsel for review. The authority review was modified in accordance with the verbal recommendations of that office.

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After review of the available original records, the radiological survey report, and the authority review, I have determined that the Department of Energy has authority to conduct remedial action at the former AEC facility in Luckey, Ohio. This authority includes both the beryllium and radioactivity at the site.



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Attachment

cc:
Steve Miller, GC-11

Authority Review for
Motor Wheel Corporation Site
in Luckey, Ohio

INTRODUCTION

As part of the Formerly Utilized Sites Remedial Action Program (FUSRAP), the U.S. Department of Energy (DOE) has reviewed available information on the Motor Wheel Corporation site in Luckey, Ohio. This site is being investigated as a candidate for inclusion in FUSRAP, which includes certain sites that were previously involved with activities of the Manhattan Engineering District (MED) or U.S. Atomic Energy Commission (AEC), both DOE predecessors. Such sites may require remedial action if they have residual contamination from those previous activities. This review is conducted to determine whether DOE has the authority for remedial action at the Motor Wheel site.

The Motor Wheel Corporation site is located in Luckey, Ohio, approximately 22 miles southeast of Toledo, at 21200 Luckey Road. The site is bounded on the south by Gilbert Road, on the east by Conrail (formerly New York Central Railroad), and on the north by the Toussaint Creek. This site is the location of the former plants of the Magnesium Reduction Corporation, Diamond Magnesium Company, and Atomic Energy Commission. Brush Beryllium Company was the operator of the AEC facility. The period of interest is 1942 to 1959, when the plants may have been involved in processes that resulted in contamination (particularly, beryllium and uranium) now present at the site.

The remainder of this review consists of the following sections:

- Sections:
2. Operational History
 3. Current Conditions
 4. Authority Analysis
 5. Discussion and Conclusions
 6. Copies of References

The information presented in these sections is in summary form. Pertinent references are identified in the text and provided in Section 6 for further use.

OPERATIONAL HISTORY

In 1942, a magnesium reduction facility was constructed at the Luckey, Ohio, site on land purchased by the Defense Plant Corporation (U.S. Government). The facility was operated for the government by National Lead (assignee, Magnesium Reduction Company) during World War II. It is unlikely that the dolomite used as a feed stock or reagents would have produced radioactive contamination. The facility was closed in 1945 and in 1948, was quit-claimed from the Reconstruction Finance Corporation (successor to the Defense Plant Corporation) to the U.S. Government (Ref. a, f).

In 1949, the property was declared surplus and assigned to the General Services Administration (GSA). A beryllium production facility was constructed at the site by the AEC. This plant was owned by the AEC and operated from 1949 to 1958 by Brush Beryllium Company (later changed to Brush

Wellman). Brush Wellman was also tasked to maintain the inactive magnesium reduction facility in a stand-by status.

The beryllium plant had a capacity to produce 4,000 pounds per month. The AEC expected to require a minimum of 40,000 pounds (Ref. j). All or part of the beryllium production plant may have been in standby mode by 1954 (according to proposed Amendment 31 to the prime contract), which would imply production between 40,000 and 144,000 pounds of beryllium for the AEC. According to Brush Wellman, the plant operated at about one half its capacity (Ref. m).

The process used to refine the beryllium ore into beryllium powder and metal was unlikely to introduce any reagents that would produce uranium contamination. However, the AEC-provided beryl ore may have contained small quantities of uranium, because the ore is thought to be from South American pegmatite formations or because of contamination during ore grinding in the rock grinders at the AEC Middlesex (NJ) facility. The Middlesex facility ground and sampled high grade uranium ore for the AEC. Thus, uranium may have been present in the ore when it was mined, or the uranium may have been introduced as a contaminant before the ore reached Luckey (Ref. l). This uranium (regardless of its source) would have been separated out as fines or suspended in liquid along with other byproducts.

The waste solutions and precipitated sludges from the beryllium operation were impounded in lagoons approximately 1.2 meters deep. The lagoons were formed by excavating the top layer of soil and using the soil to construct dikes. Reportedly, the lagoon liner was compacted clay. Excess wastewater that accumulated in the lagoons was discharged to the Toussaint Creek, in accordance with Ohio Water Pollution Control Agency regulations. As a lagoon section filled with sludge, additional sections were added. Three lagoons, A, B, and C, were constructed and used for impoundment. A fourth lagoon, Lagoon D, was constructed in 1956, but was never used. A small landfill was located north of the sewage disposal plant (Ref. a). A large landfill in the northeast part of the site probably became operational in 1957.

In 1950, the government-owned, contractor-operated site was referred to as the "M and B Plant" (for magnesium and beryllium). At that time the magnesium reduction facility was in a stand-by status. The facility was subsequently used by the Diamond Magnesium Company to process magnesium (Ref. a).

In October 1951, the General Service Administration (GSA) asked the AEC to transfer ferrous metal scrap to the GSA for use in control of chlorine fumes in producing magnesium. The magnesium was to be produced by Diamond Magnesium Company at its plant in Painesville, Ohio. The ferrous metal scrap was present at the AEC's Lake Ontario Storage Area (Ref. k).

In December 1951, 1,000 tons of scrap steel (contaminated by fission products, yellow-salt, and concrete flooring) were sold to Diamond Magnesium for use in the processing of magnesium at the Luckey Plant. The scrap from the Lake Ontario Storage Area had been surveyed by the AEC, and found to have radioactivity (attributed to uranium yellow-salt) that was well within ICC

regulations for shipment. Progress reports of the AEC's Tonawanda office indicated that rail shipments to Diamond Magnesium at Luckey took place in December 1951 through January or February 1952. Subsequent shipments were to the Painesville, Ohio, plant of Diamond Magnesium (Ref. k). Former employees of Brush Wellman indicate that the magnesium plant never operated but that the scrap steel was received at the plant (Ref. m).

In 1959, the Luckey plant was closed. AEC contracted with Brush Wellman to close the plant. An 8.5-acre, dike-enclosed landfill was constructed at the northeast corner of the property and, reportedly, the hazardous sludge and contaminated soil located in Lagoons A, B, and C were moved to that landfill (Ref. f). The plant closure plan specified leveling the dikes on the empty lagoons and filling the lagoons with sufficient clay to bring the areas to ground level. The 8.5-acre landfill area was then capped, graded, and seeded (Ref. m).

The facility was sold in 1961 by the GSA to Vulcan Materials Company's Aluminum and Magnesium, Inc. division. The government reserved the right of ingress and egress to remove the beryllium ore on the site (Ref. f).

In 1967, Aluminum and Magnesium, Inc. transferred the property to its parent company, Vulcan Materials. In 1968, the property was transferred to the Goodyear Tire and Rubber Company. In 1987, the property was transferred to the present owner, Motor Wheel Corporation, a former subsidiary of Goodyear (Ref. f).

CURRENT CONDITIONS

Currently, Motor Wheel Corporation has a light manufacturing plant operating at the site. The northern part of the property is leased for farming. The building that was used to process magnesium is not being used and is scheduled for demolition.

On-site contamination has been identified in surveys by the Ohio Environmental Protection Agency (OEPA), the DOE, the Ohio Department of Health, and Motor Wheel. Concentrations of uranium ranging from 2.6 to 280 picoCuries per gram, radium from 2.1 to 4000 picoCuries per gram, and thorium from 0.2 to 4.3 picoCuries per gram of soil (Ref. b) have been identified. Areas of the site have residual radioactivity exceeding DOE guidelines for unrestricted release (Guidelines for Residual Radioactive Materials at Formerly Utilized Sites Remedial Action Program and Remote Surplus Facilities Management Program Sites, 1987). Beryllium concentrations ranged from 120 to 6,400 micrograms per gram of soil, which are well above background. Other hazardous substances may be present, including sludge, inorganic chemicals, and heavy metals (Ref. g). No radioactive contamination was found in the former magnesium-production building (Ref. d). OEPA performed an inspection of the site on September 13, 1983, which was documented in a PA/SI dated January 25, 1984, (Ref. g) for consideration on EPA's National Priority List (NPL); the site has not been included on the NPL.

Lagoons A and B, which held the beryllium facility's waste solutions and precipitated sludge, appeared not to have been dredged or backfilled to ground level as indicated in the closure plan (Ref. b, f). Analysis of soil samples taken at depths of 0 to 105 centimeters indicate that Lagoon C was covered with a layer of approximately 60 centimeters of soil, but the lagoon was not excavated to remove sludge and contaminated soil prior to the addition of the cover of soil. The high concentrations of radioactivity and beryllium were found not to be limited to just the lagoons or the diked landfill (Ref. b).

AUTHORITY ANALYSIS

The authority determination is made according to the FUSRAP protocol by considering the answers to five questions based on available records. The answers to these questions from a review of available information are provided below.

- o Was the site/operation owned by a DOE predecessor or did a DOE predecessor have significant control over the operations or site?

The site was owned by the U.S. Government during the 1942 to 1959 period of operation. The U.S. Government's Defense Plant Corporation purchased the site in 1942, for the construction and operation of the magnesium reduction facility. In 1948, the property was assigned to the General Services Administration (GSA).

The site was operated solely for the AEC by Brush Beryllium Company (later, Brush Wellman), using government-owned buildings and equipment, under contracts with the AEC between 1949 and 1959. Contract AT(30-1)-541 (Ref. a) called for Brush Beryllium to establish the plant, to produce and fabricate various beryllium products, and to maintain the magnesium production facility for possible use. Article III-A.4 called for possible "beryllium, thorium, and uranium research...from time to time," and Article III-A.3 called for "performing...fabricating operations on...thorium between 1951 and 1953." The contract also specified (Article VII-I) that the government retained ownership to property, which included "by-products," "residues," "wastage," and "scrap." Contract AT(11-1)-830 with the AEC, dated September 1, 1959, called for closure of the site. The May 19, 1961, GSA transfer of the Luckey property to Aluminum and Magnesium, Inc. reserved the ingress/egress right to remove all beryllium ore then stored on the property, and the transfer did not include beryllium ore then stored on the land (Ref. f).

The magnesium reduction facility was apparently operated again in the 1950's under contract to the National Industrial Reserve Division of the GSA, although Brush Wellman indicates that the magnesium plant did not operate (Ref. m).

- o Was a DOE predecessor agency responsible for maintaining or ensuring the environmental integrity of the site (i.e., was it responsible for clean up)?

A review of the records does not indicate specifically that a DOE predecessor agency was responsible for the maintenance of the site's environmental integrity. However, the AEC's operations contract AT(30-1)-541 (Article VII-I) required the contractor to "conform to all health and safety regulations and requirements of the Commission," and a number of former AEC health and safety officials have stated that they inspected the facility. (ref. c) Article IV-C (1)(m) stated that the AEC would reimburse Brush for "Expenses in connection with any temporary or permanent closing down or decontamination of the M and B Plant and/or the Beryllium Plant, or any part thereof." In 1954, the AEC recommended Amendment 31 to the contract to include sludge recovery, and draining out and cleaning up the plant. The AEC contracted with Brush Wellman for site closure in 1959. The AEC's plant closure contract, AT(11-1)-830, has not been located for review.

- o Is the waste or radioactive material on the site the result of DOE predecessor related operations?

Elevated beryllium levels are the result of beryllium production. Radioactive material on the site are probably the result either or both of two actions:

- o Using AEC-provided beryl ore (containing uranium) in AEC-contracted operations to produce beryllium. The ore had been previously ground at the AEC Middlesex (NJ) facility and may have become contaminated with uranium at that time.
- o Using AEC-provided, radioactively-contaminated scrap, ferrous metal.
- o Is the site in need of further clean up and was the site left in a non-acceptable condition as a result of DOE predecessor related activity?

Chemical and radiological surveys have indicated widespread contamination on the surface and below the surface. Elevated levels of beryllium are well above normal concentrations. Concentrations of uranium-238 and radium-226 exceed the DOE guidelines for unrestricted use (Guidelines for Residual Radioactive Materials at Formerly Utilized Sites Remedial Action Program and Remote Surplus Facilities Management Program Sites, 1987). It is highly probable that this contamination resulted from either or both the AEC-provided beryl ore and its byproducts, or the AEC-provided, radioactively-contaminated scrap.

- o Did the present owner accept responsibility for the site with knowledge of its contaminated condition and that additional remedial measures are necessary before the site is acceptable for use without radiological restrictions?

The May 19, 1961, GSA transfer of the Luckey property to Aluminum and Magnesium, Inc. reserved the ingress/egress right to remove all beryllium ore then stored on the property, and the transfer did not include beryllium ore then stored on the land.

In 1967, Aluminum and Magnesium, Inc., transferred the property to its parent company, Vulcan Materials. In 1968, the property was transferred to the Goodyear Tire and Rubber Company. In June 1981, Goodyear notified the USEPA of on-site contamination at Luckey. In 1987, the property was transferred to the present owner, Motor Wheel Corporation, a former subsidiary of Goodyear, whereby Goodyear indemnifies Motor Wheel for certain environmental obligations, which arose prior to the sale (Ref. f).

DISCUSSION AND CONCLUSIONS

Surveys of the Motor Wheel site in Luckey, Ohio, indicate that contamination includes beryllium and radioactive uranium and radium. These contaminants are widespread on the 40-acre site, which was previously used for processing magnesium and beryllium.

These contaminants are most likely the result of either or both of two actions:

- o Using AEC-provided beryl ore (containing uranium) in AEC-contracted operations with Brush Beryllium to produce beryllium (1949 to 1958).
- o Using AEC-provided, radioactively-contaminated scrap.

Therefore, based on the AEC role in site operations, DOE has the authority for remedial action at the Motor Wheel site under the Atomic Energy Act through FUSRAP. This authority includes remedial action for the observed radioactivity, the beryllium, and chemicals related to the production of beryllium.

COPIES OF REFERENCES

The following is the list of references that are provided in this section. The majority of these are comprehensive references that in turn refer to original sources.

- a. R.F. Weston, Inc./Office of Technical Services, 1989: "Background Review of the Brush Beryllium and Diamond Magnesium Plants in Luckey, Ohio." Germantown, Maryland, October 27.
- b. Foley, R.D. and J.W. Crutcher, 1990: "Results of the Preliminary Radiological Survey at the Former Diamond Magnesium Company Site, Luckey, Ohio (DML001)." ORNL/TM-11182. Oak Ridge National Laboratory, Oak Ridge, Tennessee, February.
- c. 1990-Personal Communications to W. Alexander Williams, Interview of Al Breslin (Forked River, NJ); Interview of Martin Weinstein (Potomac, MD); Interview of Paul Kleven (Del Ray Beach, FL). Messrs, Breslin, Weinstein, and Kleven are former AEC Health and Safety officials and all had inspected the Luckey facility.
- d. Mansdorf, S.Z., 1987a: Preliminary Letter Report on a survey of the former magnesium production building at Luckey. Letter to A. Blackwood, Motor Wheel Corporation from S.Z. Mansdorf & Associates, Inc., December 12.
- e. Wilmouth, B., 1988: September survey of site and buildings. Letter to Motor Wheel Corporation from Ohio Department of Health, September 14.
- f. Roundtree, N., 1988: Motor Wheel Corporation; Luckey, Ohio, Facility. Letter from The Goodyear Tire and Rubber Company to A. Wallo, DOE, August 24.
- g. OEPA, 1984: Preliminary Assessment and Site Inspection for Goodyear Site in Luckey. (Cover letter from B. Constantelos, U.S. EPA, to A. Wallo, DOE, December 5, 1988). Site OH D043642958.
- h. Ruch, J.W., 1957: Beryllium Ore in Storage at Fernald. AEC correspondence from Feed Materials Division to L. Dubinski, Inspection Division, October 23.
- i. Mansdorf, S.Z., 1987b: Drinking Water Analysis for Gross Alpha and Beta Contamination. Letter to A. Blackwood, Motor Wheel Corporation, from S.Z. Mansdorf & Associates, December 28.
- j. AEC, 1950: Brush Beryllium Company Negotiating Meeting on Contract AT (30-1)-541. USAEC Correspondence, January 27.

- k. Mitchell, A.E., 1990: Scrap Steel to Diamond Magnesium. OTS Note to A. Williams, DOE, from Weston, November 19.
- l. Consiglio, J.T., 1951: "General Information Book." USAEC, Middlesex Sampling Plant, Middlesex, January 2.
- m. Brush Wellman, 1990: Letter to W. Alexander Williams (DOE) with extensive enclosure, December 20, 1990.

Authority Review
Motor Wheel Corporation

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Williams reader

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